Technical Bulletin

DB2 Version 5 Release 1

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Section/Groups: Software Management/Database Administration
Submitted By: Brian Triptow
Approved By: Jim Calaway

On Sunday, June 14, 1998, the State of Utah will install DB2 Version 5 Release 1 on CPU4 in the DBD1 subsystem. This software will impact ORSIS WERD, WERI, WERA, and WERT regions. Subsequent installation on CPU3 is tentatively scheduled for July 1998 and will impact ORSIS production WERP.

Be aware that a REBIND will be performed on *all* DB2 PLANS and PACKAGES. Also, three new columns will be added to all PLAN_TABLEs.

Summary of Changes to DB2 for OS/390 Version 5 (formatted from *IBM Installation Guide)*

Version 5 supports all functions available in DB2 for MVS/ESA Version 4 plus enhancements in the areas of performance, capacity, availability, client/server and open systems, and user productivity. DB2 for OS/390 Version 5 also delivers a database server solution for OS/390.

Performance

Sysplex Query Parallelism

- The increased power of Sysplex query parallelism in DB2 for OS/390 Version 5 allows DB2 to go far beyond DB2 for MVS/ESA Version 4 capabilities; from the ability to split and process a single query within a DB2 subsystem to processing that same query across many different DB2 subsystems in a data sharing group.

- The advances this release offers in scalable query processing let you process queries quickly while accommodating the potential growth of data sharing groups and the increasing complexity of queries.

Prepared Statement Caching

- DB2 reduces the cost of duplicate prepares (preparations??) for the same dynamic SQL statement by saving them in a cache. Now, different application processes can share prepared statements and they are preserved past the commit point. This performance improvement offers

the most benefit for:

- Client/server applications that frequently use dynamic SQL for repeated execution of SQL statements; and,

- Relatively short dynamic SQL statements for which PREPARE cost accounts for most of the CPU expended.

Re-optimization

- When host variables, parameter markers, or special registers were used in previous releases, DB2 could not always determine the best access path because the values for these variables were unknown. Now, you can tell DB2 to reevaluate the access path at run time, after these values are known. As a result, queries can be processed more efficiently, and response time is improved.

Faster Transactions and Batch

- Caching of package authorization improves performance at run time for remote packages and applications that use pattern-matching characters in a package list.

- You can define a table space to use selective partition locking, which can reduce locking costs for applications that do partition-at-a-time processing. It also can reduce locking costs for certain data sharing applications that rely on an affinity between members and data partitions.

- A new standalone utility lets you pre-format active logs.

- With LOAD and REORG, you can pre-format data sets up to the high allocated RBA, which can make processing for sequential inserts more predictable.

Faster Utilities

- LOAD and REORG jobs run faster and more efficiently with enhanced index key sorting that reduces CPU and elapsed time, and an in-line copy feature that lets you make an image copy without a separate copy step.

- RECOVER INDEX and LOAD run faster on large numbers of rows per page.

- Sampling support for RUNSTATS reduces the processing required to collect non-indexed column statistics.

- BSAM striping improves the I/O capability of DB2 utilities.

Other Performance Enhancements

- There are several significant performance enhancements to data sharing, including selective partition locking, the MAXROWS option, and several optimizations to reduce data sharing overhead.

- SQL CASE expressions let you eliminate queries with multiple UNIONs and improve performance by using only one table scan.

- You can collect a new statistic on concatenated index keys to improve the performance of queries with correlated columns. The statistic lets DB2 estimate the number of rows that qualify for the query more accurately, and select access paths more efficiently. DB2 scans partitions more efficiently and allows scans during parallel processing.

- Non-column expressions in simple predicates are evaluated at Stage 1 and can be indexed.

Increased Capacity

DB2 for OS/390 Version 5 introduces the concept of a large partitioned table space. Defining your table space as large allows a substantial capacity increase, to approximately one terabyte of data and up to 254 partitions. In addition to accommodating growth potential, large partitioned table spaces make database design more flexible, and can improve availability.

Improved Availability

Online REORG

- DB2 for OS/390 Version 5 adds a major improvement to availability with Online REORG. Now, you can avoid the severe availability problems that occurred while offline reorganization of table spaces restricted access to read-only during the unload phase and no access during reload phase of the REORG utility. Online REORG gives you full read and write access to your data through most phases of the process with only very brief periods of read-only or no access.

Data Sharing Enhancements

- Group buffer pool rebuild makes coupling facility maintenance easier and improves access to the group buffer pool during connectivity losses.

- Automatic group buffer pool recovery accelerates GBP recovery time, eliminates operator intervention, and makes data available faster when GBPs are lost because of coupling facility failures.

- Improved restart performance for members of a data sharing group reduces the impact of retained locks by making data available faster when a group member fails.

- Changes to traces and DISPLAY GROUPBUFFERPOOL output improve monitoring.

Client/Server and Open Systems

Native TCP/IP Network Support

- DB2's support of TCP/IP networks allows DRDA clients to connect directly to DDF and eliminate the gateway machine. In addition, customers can now use asynchronous transfer mode (ATM) as the underlying communication protocol for both SNA and TCP/IP connections to DB2.

Stored Procedures

- Return multiple SQL result sets to local and remote clients in a single network operation.

- Receive calls from applications that use standard interfaces, such as Open Database Connectivity (ODBC) and X/Open Call Level Interface, to access data in DB2 for OS/390.

- Run in an enhanced environment. DB2 supports multiple stored procedure address spaces managed by the MVS Workload Manager (WLM). The WLM environment offers efficient program management and allows WLM-managed stored procedures to run as subprograms and use RACF security.

- Use individual MVS dispatching priorities to improve stored procedure scheduling.

- Access data sources outside DB2 with two-phase commit coordination.

- Use an automatic COMMIT feature on return to the caller that reduces network traffic and the length of time locks are held.

Dynamic Query and Network Performance

- Improvements for DRDA Applications.

- Reduced processing costs for block fetch operations.

- DRDA support for OPTIMIZE FOR n ROWS on SELECT.

- Faster dynamic SQL queries and reduced processing costs for VTAM network operations.

- Reduced message traffic for dynamic SQL SELECT statements.

Improved Application Portability

- DB2 for OS/390 Version 5 introduces the DB2 Call Level Interface (CLI) to MVS/ESA. Unlike applications that use embedded SQL to access DB2 data, applications that choose CLI are not tied to a pre-compiler, packages, or a plan.

- Workstation and desktop applications use standard interfaces, such as Open Database Connectivity (ODBC), to access relational data. Standard interfaces need one version of an application to access many data sources. Now, you can port UNIX workstation and PC desktop applications to DB2 for OS/390 and exploit the CLI (ODBC) capabilities without modification. In addition, applications can issue ODBC or CLI calls from within a stored procedure.

- DB2 now provides ASCII table support for clients and servers across platforms. This support reduces the cost of translation between EBCDIC and ASCII encoding schemes. ASCII table support also offers an alternative to writing field procedures that provide the ASCII sort sequence, which improves performance.

Improved Security

Did you want some text here?

User Productivity

Improved SQL Compatibility

- DB2 conforms to the ANSI/ISO SQL entry level standard of 1992. Application programmers can take advantage of a more complete set of standard SQL to use across the DB2 family to write portable applications. New SQL function includes:

  - More check options for view definitions.

  - Foreign keys that reference UNIQUE keys as well as PRIMARY keys.

  - An extension to GRANT that lets the REFERENCES privilege apply to a list of columns.

  - A new delete rule, NO ACTION, that you can use to define referential constraints for self-referencing tables.

  - SQL CASE expressions provide the capability to create conditional logic wherever an expression is allowed.

  - SQL temporary tables allow application programs to easily create and use temporary tables that store results of SQL transactions without logging or recovery.

New Access Choice

- A new attachment facility, the Recoverable Resource Manager Services attachment facility, improves access in a client/server environment. It coordinates two-phase commit processing between DB2 and other participating resource managers in any MVS application environment. Other key features include the ability for multiple users to run in a single address space, thread reuse, and moving threads between MVS tasks.

Image Copy Enhancements

- The COPY, LOAD, and REORG utilities provide:
  - Features of the COPY utility that help you quickly determine what type of image copy to take, when to take it, and let DB2 automatically take it for you.
  - In-line copy in LOAD and REORG that lets you create an image copy while improving data availability.

Improved Integration of C++ and IBM COBOL for MVS and VM Support

- It is easier for application programmers to use object-oriented programming techniques in their DB2 applications. DB2 for OS/390 Version 5 adds COBOL and C++ languages as options on installation panels, DB2I panels, the DSNH command, and DCLGEN.

Other Usability Enhancements

- To prevent long running units of work and to help avoid unnecessary work during the recovery phase of restart, DB2 issues new warning messages at an interval of your choice.
- Trace records for IFCID 0022 now include most information in the PLAN_TABLE.
- An increase from 127 to 255 rows on a page improves table space processing and eliminates the need for compression.
- Install SYSOPR can recover objects using the START DATABASE command.
- A filtering capability for DISPLAY BUFFERPOOL limits statistics information to a specified set of page sets.
- You can enter comments within the SYSIN input stream for DB2 utilities.

Server Solution

OS/390 retains the classic strengths of the traditional MVS/ESA operating system, while offering a network-ready, integrated operational environment.

The following features work directly with DB2 for OS/390 applications to help you use the full potential of your DB2 subsystem:

- Net.Data for OS/390
- DB2 Installer
- DB2 Estimator for Windows
- DB2 Visual Explain
- Workstation-based Performance Analysis and Tuning
- DATABASE 2 Performance Monitor